Grade 4
Mathematics

Constructed Response Scoring Guides
Winter 2001

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Winter 2001 Grade 4
MEAP Mathematics Scoring Guides

These scoring guides and annotated papers are provided to help you evaluate and score the constructed-response items on the Winter 2001 MEAP mathematics test. For each item a rubric and an exemplar answer are given. Student papers are provided to illustrate the rubric. The annotation are on a separate page, so that the student papers can be copied and scored as part of training.

The scoring guides provided here represent only one possibility. You may decide to create your own scoring rubric. You may want to require that spelling and grammar are part of scoring, as well as labeling (units and graphs), and showing all work. Feel free to adjust and revise the scoring guide to fit your needs.

General Recommendations and Guidelines

- Studying the sample student responses and annotations will help you understand the essence of what is expected at each score point for a particular question. Keep in mind that these sample student responses represent only a few of the many possible responses for a given score point.

- To ensure the accuracy and consistency of your scoring:

  1. Continually review the scoring rubric and the sample student papers, especially when you are in doubt about a particular response.

  2. Do not judge one student's paper against another. Instead, apply the same objective criteria to each paper by evaluating the response in terms of the scoring guide.

  3. It is advisable to conceal student names when scoring.

  4. Review papers you scored earlier in the process to make sure you are using the same criteria.

Special Note: The first constructed-response question, involving Juanita's class, is taken from the Third International Mathematics and Science Study (TIMSS) and was included to let classrooms do their own international comparison, if they chose. This is a difficult item with only 6 percent of 9-year-olds (internationally) receiving full credit.

The scoring rubric used is not part of TIMSS and was developed to demonstrate an approach that is sometimes used for scoring complex items on the MEAP. This approach examines a large number of points during scoring but then reduces the range of points to a "1 to 4" final scale.

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: _____

Is Juanita right? Answer: _____
Use words or pictures to explain.

Is Amanda right? Answer: _____
Use words or pictures to explain.

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

Grade 4 - Juanita and Amanda
Scoring Rubric

This rubric employs a value point system.

The response is worth **7 value** points:
•Answer of 30 students in the class = **1 value** point.
•Answer yes, Juanita is right = **1 value** point.
•Explanation of Juanita's answer = **2 value** points.
•Answer no, Amanda is wrong = **1 value** points.
•Explanation of Amanda's answer = **2 value** points.

Note:
An unlabled drawing in either of the justifications is worth **1 value** point.

A **4-point** response shows understanding of the content of the problem, carries the appropriate strategy to a correct solution, shows no meaningful errors and provides clear and complete explanations. The response contains **7 value** points.

A **3-point** response may show significant understanding of the content of the problem, use an appropriate strategy, show minor errors and provide nearly correct or complete explanations. The response contains **5-6 value** points.

A **2-point** response may show some understanding of the content of the problem, begin with an appropriate strategy, show some errors and provide some but not complete explanations. The response contains **4 value** points.

A **1-point** response may show minimal understanding of the content of the problem, attempt a strategy, show serious errors, some reasoning and provide insufficient explanations. The response contains **2-3 value** points.

A **0-point** response may show little or no understanding of the content of the problem, leaves the item blank or repeats the information in the question. The response contains **0-1 value** points.

Response scores 4 if it totals 7 value points.
Response scores 3 if it totals 5-6 value points.
Response scores 2 if it totals 4 value points.
Response scores 1 if it totals 2-3 value points.
Response scores 0 if it totals 1 value point.

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

Grade 4 - Juanita and Amanda
Exemplar

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 30

Is Juanita right? Answer: Yes
Use words or pictures to explain.

There are 10 girls and 20 boys;
10 x 2 = 20, so there are 2 boys for every 1 girl.

Is Amanda right? Answer: No
Use words or pictures to explain.

There are 30 students; $\frac{1}{2}$ of 30 is 15. There are less than 15 girls and more than 15 boys.

Accept any correct justification/drawing.

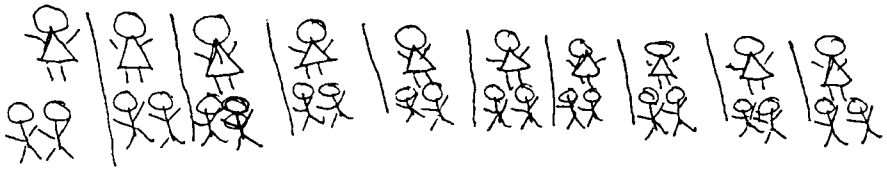
Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 30 (10 + 20 = 30)

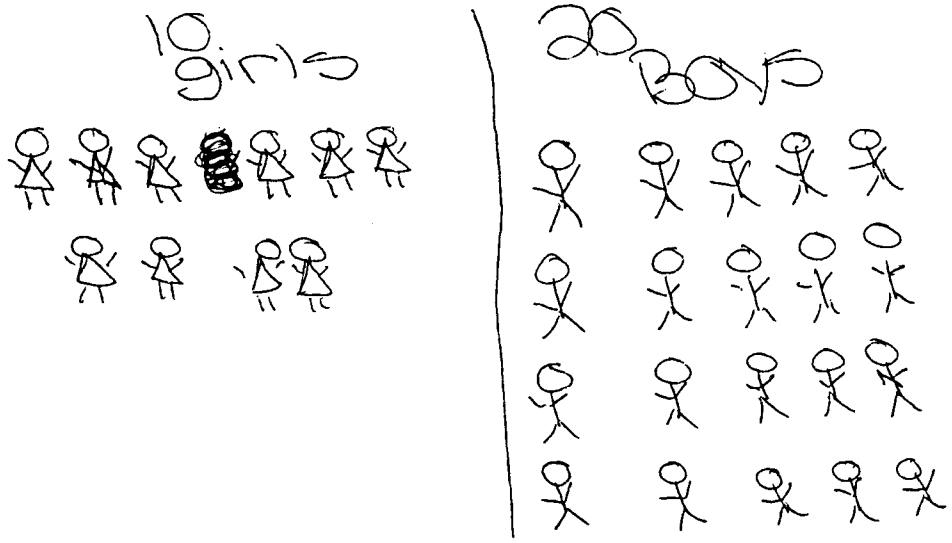
Is Juanita right? Answer: Yes

Use words or pictures to explain.



Is Amanda right? Answer: no

Use words or pictures to explain.



SCORE: 4 points	
Response totals 7 value points.	**Number of students: 1 value point** **Juanita, yes: 1 value point** **Juanita explanation: 2 value points** **Amanda, no: 1 value point** **Amanda explanation: 2 value points**

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 30

Is Juanita right? Answer: yes
Use words or pictures to explain.
$10 \times 2 = 20$, so there is 1 girl or every 2 boys, so Juanita is right.

Is Amanda right? Answer: no
Use words or pictures to explain.
$\frac{1}{2}$ of 30 is 15, and there are 10 girls so Amanda is wrong.

SCORE: 4 points	
Response totals 7 value points.	**Number of students: 1 value point** **Juanita, yes: 1 value point** **Juanita explanation: 2 value points** **Amanda, no: 1 value point** **Amanda explanation: 2 value points**

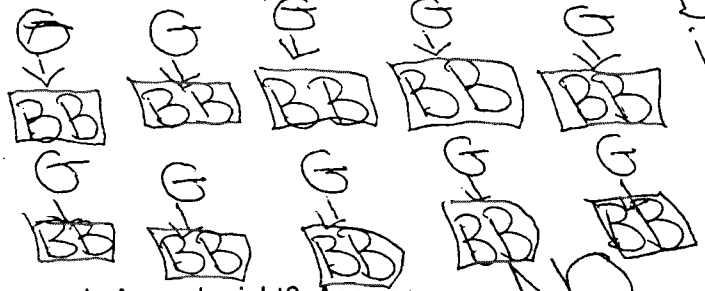
Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 30 kids

Is Juanita right? Answer: yes she is

Use words or pictures to explain. because there is 10 Girls and 20 boys 1 girl for every 2 Boys.



Is Amanda right? Answer: NO

Use words or pictures to explain.

If there was 15 girls and 15 boys she would be right.

SCORE: 4 points	
Response totals 7 value points.	**Number of students: 1 value point** **Juanita, yes: 1 value point** **Juanita explanation: 2 value points** **Amanda, no: 1 value point** **Amanda explanation: 2 value points**

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 30 people

Is Juanita right? Answer: yes because the pictur proove's it.
Use words or pictures to explain.

G BB GBB GBB GBB GBB GBB GBB

GBB GBB GBB

Is Amanda right? Answer: no she's not
Use words or pictures to explain.

NO half of the class is not Girls because half of thirty is fifteen and theres only Ten girls

SCORE: 4 points	
Response totals 7 value points.	**Number of students: 1 value point** **Juanita, yes: 1 value point** **Juanita explanation: 2 value points** **Amanda, no: 1 value point** **Amanda explanation: 2 value points**

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 30

Is Juanita right? Answer: Yes
Use words or pictures to explain. I say yes becouse I did a picture at the top and it's correct

Is Amanda right? Answer: NO
Use words or pictures to explain. Becouse there are 30 kids in the room and there are 10 girls and 20 boys so the girls are not half the class.

SCORE: 3 points	
Response totals 6 value points. **Picture at top of page explaining Juanita's answer not labeled "boys" or "girls."**	**Number of students: 1 value point** **Juanita, yes: 1 value point** **Juanita explanation: 1 value point** **Amanda, no: 1 value point** **Amanda explanation: 2 value points**

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 30 Students

Is Juanita right? Answer: yes

Use words or pictures to explain.

Is Amanda right? Answer: no

Use words or pictures to explain.

SCORE: 3 points	
Response totals 6 value points. Picture for explanation to justify Juanita's answer not labeled "boys" or "girls."	**Number of students: 1 value point** **Juanita, yes: 1 value point** **Juanita explanation: 1 value point** **Amanda, no: 1 value point** **Amanda explanation: 2 value points**

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 30 students

Is Juanita right? Answer: Yes
Use words or pictures to explain.

If you add it all up you get 10 boys and 20 girls.

Is Amanda right? Answer: No
Use words or pictures to explain.

If half of the class were girls there would be 15 girls but there is only ten girls.

SCORE: 3 points	
Response totals 5 value points. Explanation for Juanita's answer incomplete.	**Number of students: 1 value point** **Juanita, yes: 1 value point** **Juanita explanation: 0 value points** **Amanda, no: 1 value point** **Amanda explanation: 2 value points**

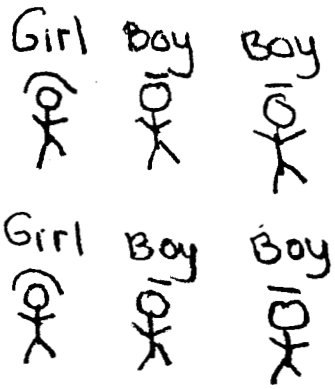
Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 30

Is Juanita right? Answer: Yes
Use words or pictures to explain.

Is Amanda right? Answer: _____
Use words or pictures to explain.



SCORE: 2 points	
Response totals 4 value points. Answer and explanation for Amanda omitted.	**Number of students: 1 value point** **Juanita, yes: 1 value point** **Juanita explanation: 2 value points** **Amanda, no: 0 value points** **Amanda explanation: 0 value points**

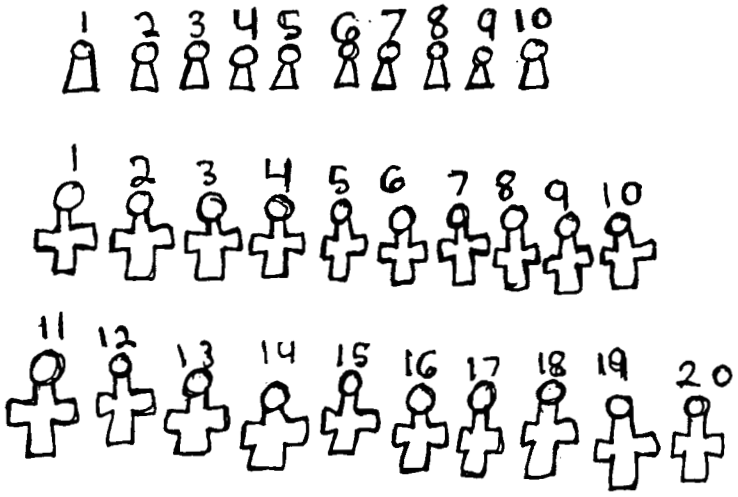
Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 30 10+20=30

Is Juanita right? Answer: _____
Use words or pictures to explain.

Is Amanda right? Answer: no+heir is 20 Boys
Use words or pictures to explain.



SCORE: 2 points	
Response totals 4 value points. **Answer and explanation for Juanita omitted.**	**Number of students: 1 value point** **Juanita, yes: 0 value points** **Juanita explanation: 0 value points** **Amanda, no: 1 value point** **Amanda explanation: 2 value points**

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 30

Is Juanita right? Answer: yes
Use words or pictures to explain. U

Is Amanda right? Answer: No
Use words or pictures to explain.

SCORE: 1 point	
Response totals 3 value points. Explanation for Juanita's and Amanda's answers omitted	**Number of students: 1 value point** **Juanita, yes: 1 value point** **Juanita explanation: 0 value points** **Amanda, no: 1 value point** **Amanda explanation: 0 value points**

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 10 + 20 =

Is Juanita right? Answer: No
Use words or pictures to explain.

Is Amanda right? Answer: yes
Use words or pictures to explain.

SCORE: 1 point	
Response totals 2 value points. **Number of students incomplete.** **Explanations for Juanita's and Amanda's answers omitted.**	**Number of students: 0 value points** **Juanita, yes: 1 value point** **Juanita explanation: 0 value points** **Amanda, no: 1 value point** **Amanda explanation: 0 value points**

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 20

Is Juanita right? Answer: yes
Use words or pictures to explain.
Juanita is right because
10 x 2 = 20

Is Amanda right? Answer: yes
Use words or pictures to explain.
Amanda is right because if two boys are counted for one girl that would be ½ of the class.

SCORE: 1 point	
Response totals 3 value points. **Number of students incorrect.** **Answer and explanation for Amanda incorrect.**	**Number of students: 0 value points** **Juanita, yes: 1 value point** **Juanita explanation: 2 value points** **Amanda, no: 0 value points** **Amanda explanation: 0 value points**

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: 30

Is Juanita right? Answer: No
Use words or pictures to explain.

Because Juanita said that there is one girl for every two boys

Is Amanda right? Answer: Yes
Use words or pictures to explain.

Amanda said that means $\frac{1}{2}$ of all of the students in the class are girls

SCORE: 0 points	
Response totals 1 value point. Answers for Juanita and Amanda incorrect. Explanations for both restate information given in the problem.	**Number of students: 1 value point** **Juanita, yes: 0 value points** **Juanita justification: 0 value points** **Amanda, no: 0 value points** **Amanda justification: 0 value points**

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are in Juanita's class? Answer: their are 30 kids

Is Juanita right? Answer: NO
Use words or pictures to explain.

beacuse there are more boys than girls

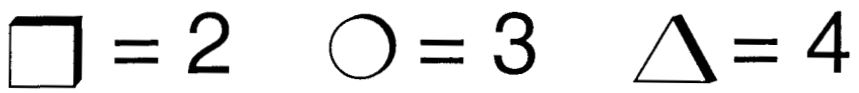
Is Amanda right? Answer: yes
Use words or pictures to explain.

half 30 is ten

SCORE: 0 points	
Response totals 1 value point. **Number of students correct.** **Answers for Juanita and Amanda incorrect. Explanations for both incomplete.**	**Number of students: 1 value point** **Juanita, yes: 0 value points** **Juanita justification: 0 value points** **Amanda, no: 0 value points** **Amanda justification: 0 value points**

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

Use the symbols below to make one addition (+), one subtraction (—) and one multiplication(×) equation.



Here is an example of an addition equation.

Addition equation

Subtraction equation

Multiplication equation

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

Grade 4 - Equations
Scoring Rubric

A **4-point** response shows understanding of the content of the problem, carries the appropriate strategy to a correct solution and shows no meaningful errors. The response meets all the criteria by exhibiting the following:
- 3 correct equations
- Correct use of symbols

A **3-point** response may show significant understanding of the content of the problem, use an appropriate strategy and show minor errors. It meets most of the criteria and exhibits the following or similar:
- 2 correct equations with correct use of symbols; third equation incomplete, incorrect or omitted.

A **2-point** response may show some understanding of the content of the problem, begin with an appropriate strategy and contain some errors. It meets some of the criteria and may exhibit the following or similar:
- One correct equation with correct use of symbols; other 2 equations may be incomplete, incorrect or omitted.

A **1-point** response may show minimal understanding of the content of the problem, attempt a strategy, show serious errors, some reasoning and provide insufficient justifications. It meets very little of the criteria and may exhibit the following or similar:
- No correct equations; all three attempted; symbols used in all three.

A **0-point** response may show little or no understanding of the content of the problem, leaves the item blank or repeats the information in the question. It meets none of the criteria and may exhibit the following or similar:
- No correct equations; symbols omitted or used incorrectly.

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

Grade 4 - Equations
Exemplar

Accept any correct equations that contain correct use of symbols. A few examples follow.

Addition equation examples

$\square + \bigcirc = 5$

$\square + 7 = 9$

$\square + \bigcirc + \Delta = 9$

Subtraction equation examples

$\bigcirc - \square = 1$

$10 - \Delta = 6$

$9 - \Delta - \bigcirc = 2$

$8 - \Delta = \Delta$

Multiplication equation examples

$\square \times \bigcirc = 6$

$\bigcirc \times 5 = 15$

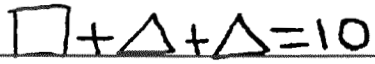
$\square \times \square \times \Delta = 16$

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

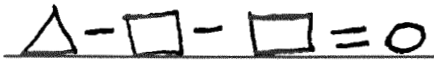
Use the symbols below to make one addition (+), one subtraction (—) and one multiplication(×) equation.

Here is an example of an addition equation.

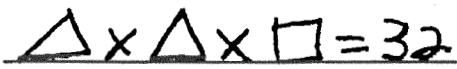
Addition equation



Subtraction equation



Multiplication equation



SCORE: 4 points

Response contains 3 correct equations with correct use of symbols.

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

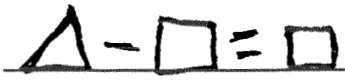
Use the symbols below to make one addition (+), one subtraction (—) and one multiplication(×) equation.

□ = 2 ○ = 3 △ = 4

Here is an example of an addition equation.

□ + △ = 6

Addition equation 

Subtraction equation 

Multiplication equation 

SCORE: 4 points

Response contains 3 correct equations with correct use of symbols. Note: Use of all symbols is considered correct.

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

Use the symbols below to make one addition (+), one subtraction (—) and one multiplication(×) equation.

□ = 2 ○ = 3 △ = 4

Here is an example of an addition equation.

□ + △ = 6

Addition equation △+○=7

Subtraction equation ○-□=1

Multiplication equation ○×○=9

SCORE: 4 points

Response contains 3 correct equations with correct use of symbols.

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

Use the symbols below to make one addition (+), one subtraction (—) and one multiplication(×) equation.

□ = 2 ○ = 3 △ = 4

Here is an example of an addition equation.

□ + △ = 6

Addition equation ③+△+7

Subtraction equation △ − □ = □

Multiplication equation □ × ③ × △ = □ △

SCORE: 3 points

Addition equation incorrect. Subtraction equation correct. Showing 24 in symbols in multiplication equation is a non-meaningful error for this grade level and therefore correct.

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

Use the symbols below to make one addition (+), one subtraction (—) and one multiplication(×) equation.

□ = 2 ○ = 3 △ = 4

Here is an example of an addition equation.

□ + △ = 6

Addition equation

Subtraction equation

Multiplication equation

SCORE: 3 points

Addition and subtraction equations correct.
Multiplication equation contains incorrect product.

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

Use the symbols below to make one addition (+), one subtraction (—) and one multiplication(×) equation.

□ = 2 ○ = 3 △ = 4

Here is an example of an addition equation.

□ + △ = 6

Addition equation □ + ○ + △ = 9

Subtraction equation □ − △ = 2

Multiplication equation △ × △ = 16

SCORE: 3 points

Addition and multiplication equations correct.
Subtraction equation incorrect for whole numbers.
This was a recurring error in the responses.

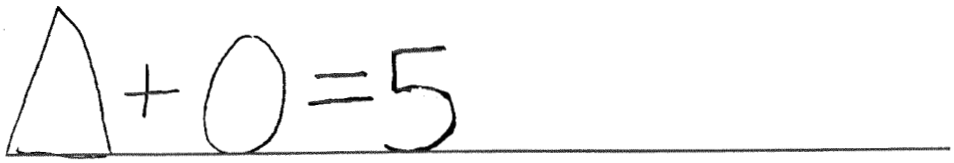
Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

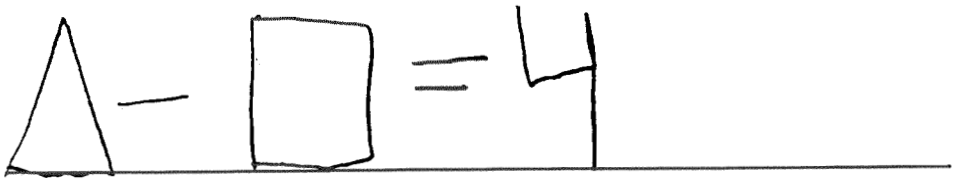
Use the symbols below to make one addition (+), one subtraction (—) and one multiplication(×) equation.

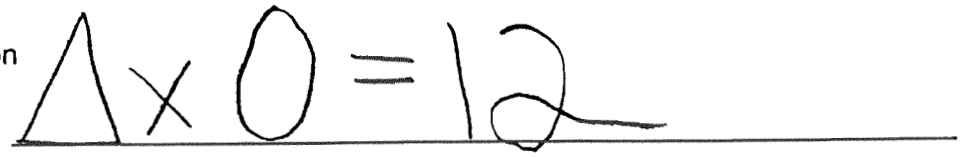
□ = 2 ○ = 3 △ = 4

Here is an example of an addition equation.

□ + △ = 6

Addition equation 

Subtraction equation 

Multiplication equation 

SCORE: 2 points

Addition and subtraction equations incorrect. Multiplication equation correct. Symbols used in all three equations.

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

Use the symbols below to make one addition (+), one subtraction (—) and one multiplication(X) equation.

□ = 2 ○ = 3 △ = 4

Here is an example of an addition equation.

□ + △ = 6

Addition equation □+○=5

Subtraction equation △+○=7

Multiplication equation ○+□=5

SCORE: 2 points

First addition equation correct. Second and third equations should be subtraction and multiplication and are therefore incorrect.

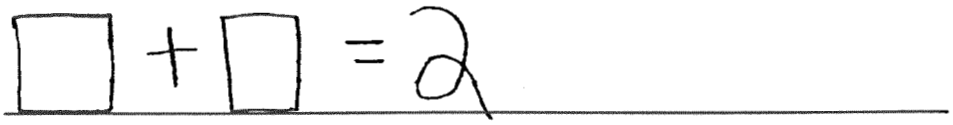
Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

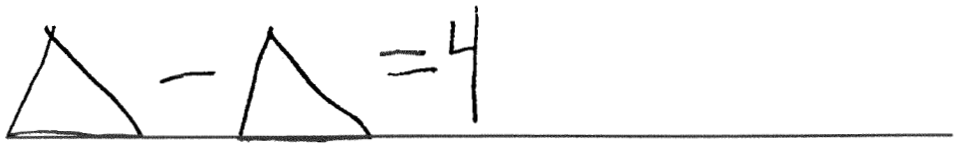
Use the symbols below to make one addition (+), one subtraction (—) and one multiplication(×) equation.

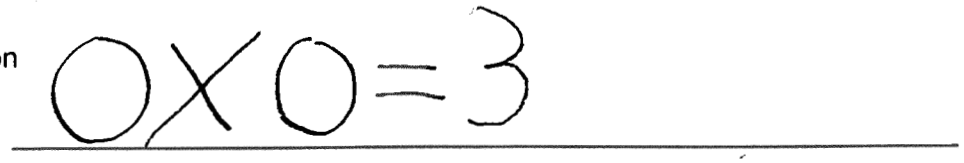
□ = 2 ○ = 3 △ = 4

Here is an example of an addition equation.

□ + △ = 6

Addition equation 

Subtraction equation 

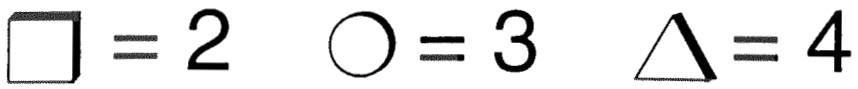
Multiplication equation 

SCORE: 1 point

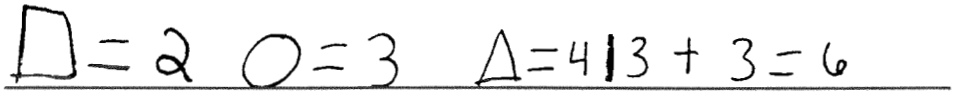
No correct equations. All three attempted. Symbols used.

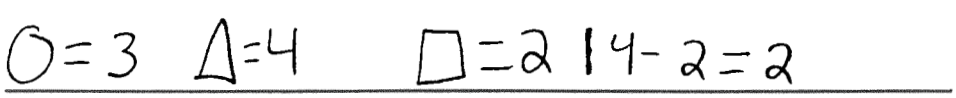
Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

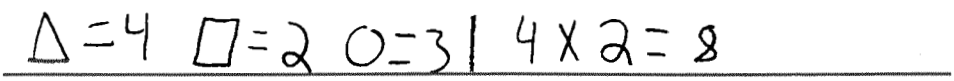
Use the symbols below to make one addition (+), one subtraction (—) and one multiplication(X) equation.



Here is an example of an addition equation.

Addition equation 

Subtraction equation 

Multiplication equation 

SCORE: 0 points

Restated the problem by copying the symbols in the stem. No symbols used to write equations as stated in directions. No understanding of the content of the problem.

Directions: Solve the following problem. There may be more than one way to answer correctly. Show as much of your work as possible.

Use the symbols below to make one addition (+), one subtraction (—) and one multiplication(×) equation.

Here is an example of an addition equation.

Addition equation 2+4=6

Subtraction equation 6-2=4

Multiplication equation 2x3=6

SCORE: 0 points

No symbols used in any equations. No understanding of the content of the problem.